

Are vehicles 'mobile bird hides'? A test of the hypothesis that 'cars cause less disturbance'

Patrick-Jean Guay^{1,2}, Emily M McLeod¹, Alice J Taysom¹, and Michael A Weston^{3†}

¹Applied Ecology Research Group and Institute for Sustainability and Innovation, College of Engineering and Science, Victoria University – St-Albans Campus, PO Box 14428, Melbourne MC, Victoria 8001

²College of Health and Biomedicine, Victoria University – St-Albans Campus, PO Box 14428, Melbourne MC, Victoria, 8001

³Centre for Integrative Ecology, Faculty of Science, Engineering and the Built Environment, School of Life and Environmental Sciences, Deakin University, 221 Burwood Highway, Burwood, Victoria, Australia 3125

†Corresponding author: E-mail: mweston@deakin.edu.au

Abstract

We tested the 'cars cause less disturbance' hypothesis by comparing the flight-initiation distance (FID) evoked by a car versus a single walker for 38 species of waterbird ($n = 657$ standardised approaches). For the 15 species where we had sample size adequate for statistical testing ($n \geq 5$), we found that cars elicited shorter responses after controlling for starting distance. Within-species analyses revealed that this difference was significant in 8 of 15 species. Although mean FIDs for car approaches were always shorter than FIDs toward single walkers in the remaining species (7), the tests in those species lacked sufficient power to draw meaningful conclusions. Our results provide support for the hypothesis that birds respond to cars at shorter distances. The wide taxonomic breadth of species investigated suggests that this principle may be broadly applicable, at least in waterbirds. The results of this study and the FID estimates we present will allow development of meaningful stimulus-specific buffer zones to protect waterbirds from disturbance. (*The Victorian Naturalist* 131 (4) 2014, 150-155)

Keywords: Flight-initiation distance, disturbance, wetlands, vehicles, motorised transport

Introduction

'Disturbance' is the disruption of the normal activity or physiology of wildlife, such as birds, in the proximity of an agent such as a person or vehicle (i.e. a stimulus; Weston *et al.* 2012). One broadly accepted metric used to describe disturbance is flight-initiation distance (FID), the distance between a stimulus and a bird when an escape response is initiated (Blumstein 2003). While a range of internal and external factors influence FID (Guay *et al.* 2013a, Guay *et al.* 2013c), the type of stimulus is a little studied but important one (McLeod *et al.* 2013). For example, birds alter aspects of their responses including their FIDs when presented with different stimuli (Miller *et al.* 2001, Glover *et al.* 2011; Schlacher *et al.* 2013b; McLeod *et al.* 2013). The type of stimulus which is permitted in a given area is often under the influence of land managers (e.g. Antos *et al.* 2007), and given that disturbance is regarded as a conservation problem in some circumstances (e.g. Schlacher *et al.* 2013a), understanding which stimuli are associated with which responses will aid the management of disturbance (Weston and Elgar

2005, 2007, Weston *et al.* 2012). Theoretically, managers could permit only certain stimuli, or prescribe stimulus-specific buffer zones to minimise disturbance (Weston *et al.* 2009; Weston *et al.* 2012; McLeod *et al.* 2013). Currently, the vast majority of avian FIDs available worldwide are elicited by single walkers, thus there is a dearth of available information on other, common, stimuli (McLeod *et al.* 2013).

One commonly held but little tested belief is the somewhat counter-intuitive idea that birds can be approached more closely in vehicles (henceforth 'cars') than on foot i.e. the 'cars cause less disturbance' hypothesis. Many birdwatchers and photographers use cars to approach birds because they believe this allows them to approach the birds more closely than would otherwise be possible on foot (authors, pers. obs.). However, this hypothesis has only rarely been tested, and the available results vary between species, with cars evoking shorter, similar, and longer FIDs compared with single walkers (reviewed in McLeod *et al.* 2013). This study aims to test whether FIDs evoked by ve-